

**OBSERVATIONS ON THE LIFE HISTORY OF *ARGYNNIS*  
*HYPERBIUS INCONSTANS* BUTLER (LEPIDOPTERA: NYMPHALIDAE)**

By T. A. and K. J. Lambkin  
15 View St, Paddington, Queensland, 4064.

**Abstract**

Observations on the life history of *Argynnis hyperbius inconstans* Butler are recorded from material collected near Gympie, southeast Queensland. The larval food plant is *Viola betonicifolia* Sm.

**Introduction**

The Australian Fritillary, *Argynnis hyperbius inconstans*, is distributed along the east coast of Australia from Gympie to Urunga (Common and Waterhouse, 1972) and usually occurs "around river estuaries or swampy coastal areas" (McCubbin, 1971). The life history for this subspecies has not previously been recorded although Waterhouse (1932) notes that the larvae "were found many years ago feeding on Wild Violets by the late Rowland Illidge".

On two weekends in January 1977 four eggs which were observed being laid and several second last and final instar larvae found feeding on wild violets (*Viola betonicifolia*) were collected from the locality, 10 km south of Gympie, recorded by Binns (1976). Several adults were also taken. Two of the eggs subsequently hatched but one of the larvae died during the first instar and the other survived only to second instar. The larvae which were taken in the field were reared to adults. Rearing of the eggs and larvae took place in Brisbane.

**Life history**

*Egg* (Fig. 1). Pale yellow, about 0.9 mm high and 0.7 mm wide (greatest width); somewhat dome-shaped with 16 or 18 longitudinal ribs and numerous continuous horizontal connecting ribs more closely spaced basally than apically; about half the number of longitudinal ribs terminating at about three quarters length, the remaining ribs continuing to form an irregular series of depressed areolets over the apical quarter; micropylar depression hexagonal. Duration of egg stage, 5 days.

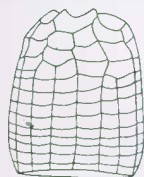


FIG. 1. Egg of *Argynnis hyperbius inconstans*.

*Larva*. First instar. On emergence, head black with long primary setae; body white, lateral to dorsolateral regions of abdomen and dorsal region of abdominal segment 1 brownish; body setae on darkened bases, the setae of last 3 abdominal segments curved backwards, the rest mostly forwards. Colour darkens with age; just before ecdysis body mostly dark brown with a lateral white stripe and pairs of white dorsal spots on mesothorax, metathorax and abdominal segments 2, 4 and 6. Duration of first instar, 5 days.

Second instar. Body brownish black with short, thick scoli in same pattern as final instar; lateral abdominal scoli, dorsal scoli of prothorax, mesothorax and abdominal segments 2, 4, 6, 8 and 9 cream-brown, all other scoli brownish black.

Second last instar similar to final instar.

Final instar (Fig. 2). Total length (unstretched), about 40 mm. Head black with 2 small anterodorsal blunt horns. Body black, with a dorsal longitudinal broad orange stripe becoming indistinct on abdominal segments 8 and 9; abdomen with obscure pinkish-orange markings along row of lateral scoli; anal plate pinkish-orange with a broad median black stripe; legs black; prolegs black basally, plantae orange. Thorax and abdomen with well developed long scoli with black secondary setae; prothorax with 4 scoli, anterior dorsal pair black, posterior dorsolateral pair each mostly black but with basal eighth dull orange; mesothorax with a dorsal pair of scoli, each mostly black but with basal quarter reddish-pink; metathorax with 4 scoli, a dorsal pair each with basal half reddish-pink and apical half black, an anterior dorsolateral pair similar to dorsal pair; abdominal segments 1-8 with dorsal, dorsolateral and lateral pairs of scoli (i.e. 6 in all per segment), segment 9 with a dorsal pair, segment 10 with a lateral pair, all reddish-pink over basal half to three quarters, apically black.

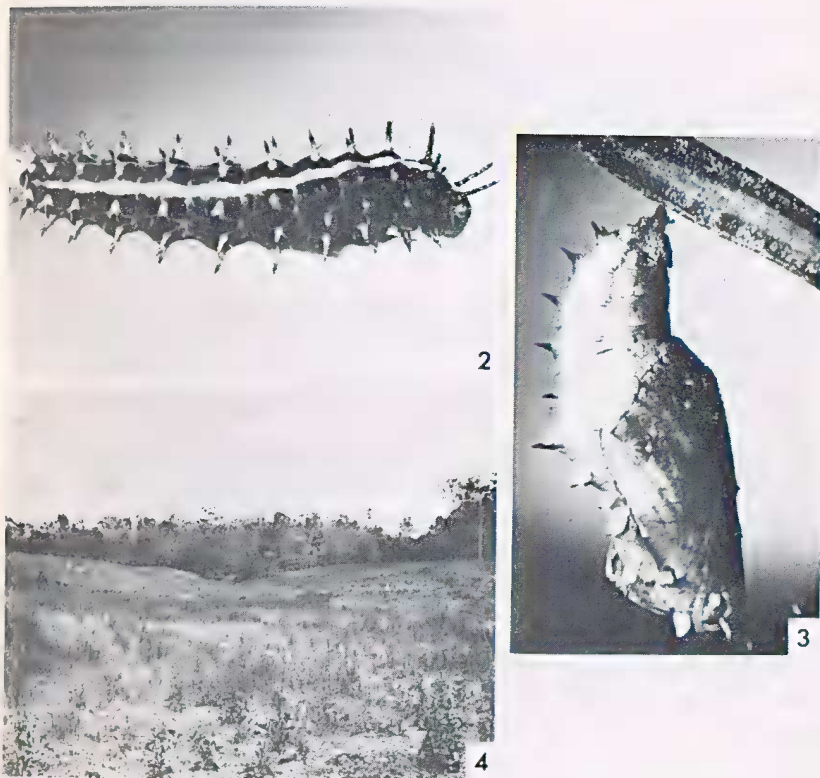
*Pupa* (Fig. 3). Total length, 26 mm. Deep orange-brown with fine dark brown markings, after about one day fading to brown to pale brown, cremasteral region remaining orange-brown. Head with a pair of blunt anteroventral horns; each thoracic segment and first 2 abdominal segments with a pair of dorsal broad-based, black-tipped metallic silver spines with anteriorly placed apices; mesothorax with a central, dorsal projection, obtuse in lateral view, with a dark brown stripe along its extremity; thorax with 2 pairs of lateral projections, the anterior pair blunt horns, the posterior pair broadly convex in dorsal view, both pairs of projections edged dorsally with dark brown; abdomen with a pair of dorsal longitudinal diffuse dark brown stripes and a diffuse dark brown stripe along each line of spiracles reaching from posterior to spiracle of segment 4; abdominal segments 3-8 each with a pair of dorsal black spines, each spine of segment 3 set on a low abdominal projection. Pupal duration 7-9 days.

*Larval food plant.* *Viola betonicifolia* Sm., family Violaceae, the purple violet or wild violet.

#### Field notes

The larvae were collected from wild violets growing along the edge of a gully overgrown with *Lomandra longifolia longifolia* (long-leaved mat rush) in a cleared paddock opposite the small swamp mentioned by Binns (1976) (See Fig. 4). The insignificant wild violets grew only along the edges of the mat rush stand and were largely hidden by the mat rushes and the long grass of the lower slopes of the gully.

Adult fritillaries were quite common along the gully. About thirty to forty were observed on the Sunday morning of the first weekend (9th January), the male to female ratio being about ten to one. Both sexes flew freely in the sunshine with a floating, gliding flight, feeding at the flowers of *Cirsum vulgare* (spear thistle) and often settling on the mat rushes. On the afternoon of the 16th January a female was observed landing in a small open patch among the long



FIGS 2-4. *Argynnis hyperbius inconstans*: (2) final instar larva; (3) pupa; (4) collection site of adults and immature stages.

grass on the lower slope of the gully. She then walked through the grass for a short distance to a wild violet and laid three eggs singly on the underside of separate leaves of *Oxalis corniculata* (creeping oxalis) which grew very close to the violet, and one egg on the upper side of a wild violet leaf.

No pupae were observed in the field.

#### Note

Adult fritillaries were still common at the locality at the end of April. On 7-8 May, 1977 three small larvae (first or second instar) were collected at night feeding on *Viola*. These pupated on 24, 25 and 26 May. None have emerged to date (7 June). This information, kindly supplied by Murdoch De Baar, indicates that the butterfly continues to breed well into the cooler part of the year.

#### Acknowledgements

We wish to express thanks to Doug Binns who kindly supplied information about the locality, the director and staff of the Queensland Herbarium for identifying the plants, J. Bartly and G. B. Monteith for the photographs, and T. Turrisi and D. Berner for help in the collection and observation of the adults and immature stages.

## References

- Binns, D., 1976. Interesting butterfly records from southern Queensland and central New South Wales. *Aust. ent. Mag.* 3(4): 73-74.
- Common, I. F. B. and Waterhouse, D. F., 1972. *Butterflies of Australia*. Angus and Robertson, Sydney. Pp. i-xii, 1-498, illustr.
- McCubbin, C., 1971. *Australian butterflies*. Nelson, Melbourne. Pp. i-xxi, 1-206, illustr.
- Waterhouse, G. A., 1932. *What butterfly is that?* Angus and Robertson, Sydney. Pp. i-x, 1-291, illustr.

**THE OAK LEAF-MINER, *PHYLLONORYCTER MESSANIELLA* (ZELLER)  
(LEPIDOPTERA: GRACILLARIIDAE) ESTABLISHED ON NORFOLK ISLAND**

By C. N. Smithers  
The Australian Museum, Sydney

Common (1976) reported the presence of the oak leaf-miner [*Phyllonorycter messaniella* (Zeller)] in Australia and gave a summary of the history of this European species in New Zealand and Australia.

Recent collecting on Norfolk Island, (South Pacific Ocean) has revealed its presence there also. Beating an oak tree, one of the few on the island, in the "Hundred Acre Reserve" at Rocky Point, dislodged a few adults and several pupae and pupal cases. The tree was heavily infested and in a sample of one hundred leaves taken at random from all sides of the tree not one was without mines. Table 1 gives the incidence of mines per leaf.

TABLE 1

No. of mines	No. of leaves	No. of mines	No. of leaves
1 - 5	15	36 - 40	4
6 - 10	26	41 - 45	2
11 - 15	12	46 - 50	1
16 - 20	20	51 - 55	0
21 - 25	6	56 - 60	2
26 - 30	6	60 - 65	1
31 - 35	5		
			Total 100

Three adults and eighteen pupae collected on 13.ii.1977 have been placed in the Australian Museum collection.

Stringent restrictions are imposed on the import of plant material of any kind into Norfolk Island and it seems likely that the species has arrived without man's assistance as there is no indication that suitable host material has recently been imported.

## Reference

- Common, I. F. B., 1976. The oak leaf-miner, *Phyllonorycter messaniella* (Lepidoptera: Gracillariidae) established in Australia. *J. Aust. ent. Soc.* 15(4): 471-473, 6 figs.